



# Rail Best Practices Review

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# Rail Best Practices Review

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- Rail shipment incidents
  - Brookhaven shipment to Envirocare – railcars arrived with water (melted snow) leaking (March 2005)
  - Portsmouth shipment to Envirocare – Metal debris gondola car arrived with portion of burrito bag open (May 2005)
  - Mound shipment to Envirocare – Utah NOV for railcar not in a strong tight condition due to a minor breach of the railcar liner (May 2005)
- Review conducted May 18 – 19 , 2005
- Host site – Oak Ridge
- Focused on loading and securement



# Who Participated?

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- EM generator/shipping sites:
  - Fernald
  - Brookhaven
  - Rocky Flats
  - Savannah River
  - Oak Ridge (ETTP)
  - Portsmouth
  - Paducah
- Receiver Sites – Envirocare and WCS
- Suppliers – Boston Transit Group, MHF, and Cavanagh Services Group
- Rail Carriers – CSX and UP



# Review Activities

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- A loading operation observation tour at East Tennessee Technology Park (ETTP) site
- Discussion sessions of presenting and sharing valuable experiences and lessons learned from the perspectives of generators, shippers, suppliers, rail carriers, and receivers
- A brainstorming session of best practices for a safe and compliant rail shipment



# Fernald Best Practices

- 190 DOE-owned (plus 60 leased) railcars with hard covers.
- Use 60-car unit trains for shipment to Envirocare of Utah.



September 20, 2005



# Fernald Best Practices

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- Key components of success for Fernald campaign:
  - Training of all personnel involved and retraining periodically.
  - Taking advantage of unit train to optimize rail shipping schedule.
- Key lessons learned by Fernald:
  - Diligence.
  - Inspections to ensure every aspect of shipping are compliant.
  - Contact with railroads.
  - Contact with the disposal site.



# Brookhaven Best Practices

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- Loading best practices:
  - Patch holes.
  - Use Geotextile liners.
  - Use Super Load Wrapper.
  - Use double-wrapper for debris and use soil around debris to avoid puncture.
  - Use absorbent inside the package.
  - Use covers on all railcars.
  - Complete loading of a railcar in one day.
  - DOE reviews all waste management and railcar shipment checklists prior to shipment.



# Brookhaven Best Practices



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# Rocky Flats Best Practices

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- Scope is to ship demolished building rubbles in gondola cars and rail intermodal to Envirocare of Utah.
- Loading best practices:
  - Install Geotextile liners of bottom of car and top of waste.
  - Install tarp and bow system.



# Rocky Flats Best Practices



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# Savannah River Best Practices

- Scope is to ship 36,000 drums of depleted uranium trioxide to Envirocare.
- Loading best practices:
  - Use a polypropylene-coated fabric liner (wrapper) to line an entire railcar.
  - Use the liner as the shipping package since drums were in poor condition.
  - Use 66-ft, 110-ton gondola cars as conveyance.
  - Four drums placed on pallet and banded to pallet with four metal bands.
  - Plan to use gondola cars with hard tops similar to those used by Fernald for 55-gallon drums.
  - Using 85-gallon overpacks as the shipping package (drop tested) and shipped in wide boxcars with modifications for securement.



# Savannah River Best Practices



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# Oak Ridge Best Practices

- Scope is to ship 2,500 containers of moisture-laden materials (e.g., soils, sludge, resins) for disposal at Envirocare.
- Challenges from the characteristics of waste:
  - Moisture coalesces into free liquid at top of box due to vibration and settling of matrix in transit; breach in top of box releases liquids.
- Loading best practices:
  - Package in multiple barriers with absorbent to solidify liquid from potential release point.
  - Use double layers of Super Load Wrapper.
  - Use straps outside the wrappers to secure boxes.
  - Use wooden bracing at the end of railcars to avoid boxes shifting.
  - Use tarp to cover the railcar to avoid precipitation into the car in transit.
  - QA/QC Engineer oversees the work and verifies compliance.





# Oak Ridge Best Practices



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# Top Best Practices

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## ■ Best Practices During Planning Phase:

- Define transportation scope of work and include railcar specifications and other requirements (e.g., condition of railcars) in the sub-contract with railcar suppliers.
- Thorough options analyses related to waste/material characterization, packaging, conveyance, and disposal sites.
- Dedicated fleets with hard covers when there is long lead time to procure.
- Define training needs (e.g., loading, securing, on-site railcar safety inspection, DOT compliance, etc.) and ensure training program is in place.
- Fully utilize lessons learned from others.



# Top Best Practices

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## ■ Best Practices During Pre-Loading Phase:

- Thorough inspection (e.g., moisture, holes in empty railcars).
- Compile all relevant documents/procedures.





# Top Best Practices

## ■ Best Practices During Loading Phase:

- Define critical activities and perform multiple-step inspections during loading operations and maintain records (e.g., checklists).
- Use adequate combination of layers of load/material/waste to avoid punctures to liner/intermodal.
- Prefer covered area for loading or avoid performing loading operations during inclement weather conditions and use tarps (or hard covers) to prevent rain/snow from infiltrating railcars in transit.
- Perform as much preparatory work (e.g., install liners/wrappers) as possible prior to entering contaminated work area.



# Top Best Practices

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- Best Practices During Post-Loading Phase:
  - Inspect! Inspect! Inspect! (e.g., package is closed properly, loaded waste does not cause package to fail in transit, all documentation, etc.).
  - Take pictures of outside of railcars (e.g., placards).
  - Take pictures before and after package closure.



# Opportunities

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- Polyurethane lined railcars
- All drain holes plugged
- Pre-load inspection of railcar liners
- Covered, hard-top covers/lids on gondola cars
- Unit trains if possible, avoid switch yards
- Inspections for each step of the loading process
- Banding drums on pallets horizontally and vertically
- Use of risers for positioning of closure rings
- Use of signed post-load inspection checklist
- AAR inspection of site rail operations